



# COURSE OUTLINE OF RECORD

**Number:** MATH A182H

**TITLE:** Calculus 1 and 2 Honors

**ORIGINATOR:** Tab Livingston

**EFF TERM:** Fall 2014

**FORMERLY KNOWN AS:**

**DATE OF**

**OUTLINE/REVIEW:** 04-27-2016

**CROSS LISTED COURSE:**

**TOP NO:** 1701.00

**CID:**

**SEMESTER UNITS:** 5.0

**HRS LEC:** 90.0

**HRS LAB:** 0.0

**HRS OTHER:** 0.0

**CONTACT HRS TOTAL:** 90.0

**STUDY/NON-CONTACT HRS RECOMMENDED:** 180.0

## CATALOG DESCRIPTION:

An in-depth honors level study of elementary differential and integral calculus which includes exponential, logarithmic, and trigonometric functions, techniques of integrations, sequences and series, and applications. Combines content of Math A180 and Math A185 with emphasis on theory and challenging problems in a fast-paced course for well-prepared students with previous calculus experience. May be taken for grades or on a pass-no pass basis. Transfer Credit: CSU; UC.

## JUSTIFICATION FOR COURSE:

Current student enrollment, community demand, comparable to a UC transfer course.

## PREREQUISITES:

- MATH A140: Business Calculus with a minimum grade of C or better  
or
- MATH A180: Calculus 1 with a minimum grade of C or better  
or
- MATH A180H: Calculus 1 Honors with a minimum grade of C or better  
or
- AP Calculus AB exam with a score of 3 or higher.

## COREQUISITES:

## ADVISORIES:

## ASSIGNED DISCIPLINES:

**MATERIAL FEE:** Yes [ ] No [X] Amount: \$0.00

**CREDIT STATUS:** Noncredit [ ] Credit - Degree Applicable [X] Credit - Not Degree Applicable [ ]

**GRADING POLICY:** Pass/No Pass [X] Standard Letter [X] Not Graded [ ]

**OPEN ENTRY/OPEN EXIT:** Yes [ ] No [X]

**TRANSFER STATUS:** CSU Transferable[ ] UC/CSU Transferable[X] Not Transferable[ ]

**BASIC SKILLS STATUS:** Yes [ ] No [X] **LEVELS BELOW TRANSFER:** Not Applicable

**CALIFORNIA CLASSIFICATION CODES:** Y - Not Applicable

**NON CREDIT COURSE CATEGORY:** Y - Not applicable, Credit Course

**OCCUPATIONAL (SAM) CODE:** E

**REPEATABLE ACCORDING TO STATE GUIDELINES:** No [X] Yes [ ] **NUMBER REPEATS:**

**REQUIRED FOR DEGREE OR CERTIFICATE:** No [ ] Yes [X]

Associate in Science in Physics for Transfer(Associate in Science for Transfer)

Business Administration(Certificate of Achievement)

COMPUTER PROGRAMMING(Certificate of Achievement)

COMPUTER PROGRAMMING(Associate in Science)

**GE AND TRANSFER REQUIREMENTS MET:**

IGETC Area 2: Mathematical Concepts and Quantitative Reasoning

2A: Mathematic

CSU GE Area B: Scientific Inquiry and Quantitative Reasoning

B4 - Mathematics/Quantitative Thinking

OCC AA Gen Ed

AREA A2: LANGUAGE AND RATIONALITY - Communication and Analytical Thinking

OCC AS Gen Ed

AREA A2 – ENGLISH COMMUNICATION - Communication and Analytical Thinking

**COURSE LEVEL STUDENT LEARNING OUTCOME(S) Supported by this course:**

1. Use the least upper bound property of the real numbers in order to prove limit, continuity, and sequence and series theorems.
2. Discuss the uses of Simpson's rule, Taylor's theorems, first order differential equations and techniques of integration.
3. Prove derivatives and integral theorems.

**COURSE OBJECTIVES:**

1. Use the least upper bound properties of the reals during proofs.
2. Use and prove limit and continuity theorems.
3. Prove derivative theorems.
4. Calculate definite and indefinite integrals and improper integrals, and prove related basic theorems.
5. Use standard techniques of integration.
6. Use Simpson's rule.
7. Prove sequence theorems.
8. Discuss the tests for convergence or divergence of series.
9. Apply the Taylor theorem.
10. Solve first order linear differential equations.

**COURSE CONTENT:**

**LECTURE CONTENT:**

1. Least Upper Bounds
  - a. properties of reals
  - b. induction
2. Limit and Continuity Theory
  - a. limit proofs
  - b. continuity proofs
3. Derivative Theory
  - a. definition
  - b. proofs of differentiation rules
  - c. mean value and Cauchy mean value theorems

4. Integration
  - a. upper and lower sums
  - b. definition of integration
  - c. proofs of basic properties
  - d. proofs of the fundamental theorems of calculus
5. Techniques of Integration
  - a. inverse chain rule
  - b. parts
  - c. trigonometric substitutions
  - d. partial fractions
6. Simpson's Rule
  - a. derivation
  - b. use
7. Sequences
  - a. definition of convergence
  - b. Cauchy sequences and completeness
8. Series
  - a. polynomial approximations
  - b. Taylor's theorem
  - c. uniform convergence
9. Elementary Differential Equations
  - a. separating variables
  - b. first order linear

**LABORATORY CONTENT:**

**METHODS OF INSTRUCTION:**

- A. Lecture:
- B. Independent Study:

**INSTRUCTIONAL TECHNIQUES:**

Lecture, written homework, discussion

**COURSE ASSIGNMENTS:**

**Reading Assignments**

As assigned from text.

**Out-of-class Assignments**

Written homework as assigned by instructor.

**Writing Assignments**

Written assignments, written exams, comprehensive final compared to minimum standard

**METHODS OF STUDENT EVALUATION:**

Midterm Exam  
Final Exam  
Short Quizzes  
Written Assignments  
Problem Solving Exercises

**Demonstration of Critical Thinking:**

Tests include definitions and making comparisons. Creating proofs is a high level critical thinking process.

**Required Writing, Problem Solving, Skills Demonstration:**

Written assignments, written exams, comprehensive final compared to minimum standard. Tests include definitions and making comparisons.

**TEXTS, READINGS, AND RESOURCES:**

**TextBooks:**

1. Thomas, G. B.. *University Calculus*, ed. . Chicago: Addison-Wesley, 2007

**Other:**

1. Spivak, Michael. *Calculus*. Houston: Publish or Perish, Inc., latest.

**LIBRARY:**

**Adequate library resources include:** Print Materials  
Non-Print Materials  
Online Materials  
Services

**Comments:**

**Attachments:**

[Attached Files](#)